with temperatures of 90° or higher and 100° or higher than in any previous year.

In 1910 the precipitation was the least ever recorded at Dodge City, equaling the dry year of 1893, when the total was 10.12 inches. Notwithstanding the great deficiency in precipitation, Ford County in 1910 had the largest and best paying wheat crop in its history and was among the first five counties in Kansas in wheat production. The unusually large wheat crop for that year can be attributed to the unprecedented precipitation and abnormally high temperature of November, 1909, and the severely cold December following. Up to the time of the remarkably heavy rain, sleet, and snow storm of the latter part of November, it had been unusually warm, and the ground was not frozen when the heavy precipitation occurred, which in four days amounted to 4.19 inches. Owing to the condition of the soil, nearly all of this precipitation was stored up, very little of it having been lost by evaporation. Immediately following this heavy precipitation unusually cold weather set in, December of that year being the second coldest of any December since the establishment of this station.

Prior to 1900 this section was not engaged in agricultural pursuits to any great extent. The acreage under cultivation in 1901 was not over a fourth of the acreage in winter wheat in 1913 and consequently the loss could not have been nearly as great.

While nearly all of the streams are dry at this writing, September 11, yet the supply of water from the underflow is abundant for present and future needs of man and beast. The city waterworks is pumping about 15,000 gallons of water per minute, which is, and has been, ample for all purposes. The wells will supply sufficient water for the stock during the coming winter.

The general health in this community has been good; there have been no epidemics, and sickness has probably been less than in previous years.

In addition to the damage done by the drought considerable damage was done by grasshoppers during July and the early part of August, and on the whole the droughts of 1913 have generally been considered by the oldest residents of this vicinity to have been the worst ever experienced.

NOTES ON THE HEAT AND DROUGHT OF THE SUMMER OF 1913 AT IOLA, KANS.

By H. K. HOLCOMB, Observer.

The drought and heat wave of the present year continued from July 25 to September 8, inclusive, in this vicinity. During this period the light showers which occurred were of no material benefit and the few days when the temperature fell below normal gave only temporary relief.

The mean temperature for the period of 46 days drought was 84, being an average daily excess as compared with the normal of 8°, and the accumulated excess in temperature for the period amounted to 368°. On 30 days of the period the mean temperature was above normal, and on 23 days the temperature attained a maximum of 100° or above, reaching an obsolute maximum of 105° on August 6. The total precipitation for the period was 0.35 inch, and the accumulated deficiency amounted to 4.86 inches. On 35 days of the period southerly winds prevailed.

Preceding the drought this year there was an accumulated deficiency in precipitation of 3.14 inches, which accounted for the comparatively small supply of underground water.

The drought destroyed pastures for the remainder of the season, reduced the corn in this vicinity to one-fourth of a crop, the hay to half of a crop, and the late vegetables to one-fourth of a crop. Wheat was not damaged, as that crop was matured before the drought became effective, and early vegetable crops were uninjured. The drought diminished the stock water until the supply on uplands was exhausted and many persons were compelled to haul water several miles for household and stock purposes. The volume of water stored by dams in the Neosho River would last for several months longer should no rain fall during that time. Dryness caused many cracks extending down 3 or 4 feet in the soil. Along the railroads the cracks in the ground caused sink holes and necessitated frequent repairing of the ballast. The dryness of the soil prevented plowing, and deferred the sowing of alfalfa and wheat, and the excessive heat interfered to some extent with construction work. In several localities shallow rooted shade trees died from absence of moisture in the soil. At the Iola Portland cement plant, having a capacity for producing 5,000 barrels of cement daily, the water supply stored at the regular intake became exhausted, which necessitated laying a pipe line to the Neosho River. The excessive heat also interfered with the working of the engines, causing shutdowns and repairs, and an extra force of laborers had to be employed in the mill and kiln rooms.

NOTES ON THE DROUGHT AND HEAT DURING THE SUMMER OF 1913 AT WICHITA, KANS.

By H. P. HABDIN, Observer.

Judged by the climatological data available here and the reminiscence of the oldest settlers, the 1913 drought was beyond question the most severe and caused a greater crop loss than any other drought of which we have a record or tradition.

Of the years covered by the records of this office, 1888–1913, those showing droughty conditions are:

In 1890, from June 20 to August 22, there was but 2.17 inches of rainfall, 0.01 inch or more occurring on 10 days. The mean maximum temperature was 93°, the highest 102°, and 100° or more occurred on 7 days.

In 1893, from August 1 to September 18, the total precipitation was 1.51 inches. This amount fell in showers on 8 days in August. The highest temperature was 104°, and 100° or more occurred on 2 days. This is referred to by those who went through it as a very disastrous drought.

In 1897 a drought began with May 14 and continued until August 2. In that period showers on 3 days totaled 0.64 inch in May; on 11 days, 1.99 inches in June; and on 9 days, 1.49 inches in July. June 16 a heated period began, and on August 3, when the drought was broken, there had been 48 days of insufficient precipitation, having maximum temperatures averaging 95°, and reaching 100° to 102° on 10 days. This is referred to as a crop-failure year, but the census report shows that considerable agricultural products were marketed.

In 1901 there was practically no rain, only 0.22 inch from June 20 to July 17. The daily maximum temperatures averaged 98°; 100° or more occurred on 11 days, and during the last 11 days of the drought the maximum temperatures ranged from 99° to 103°, the latter occur-